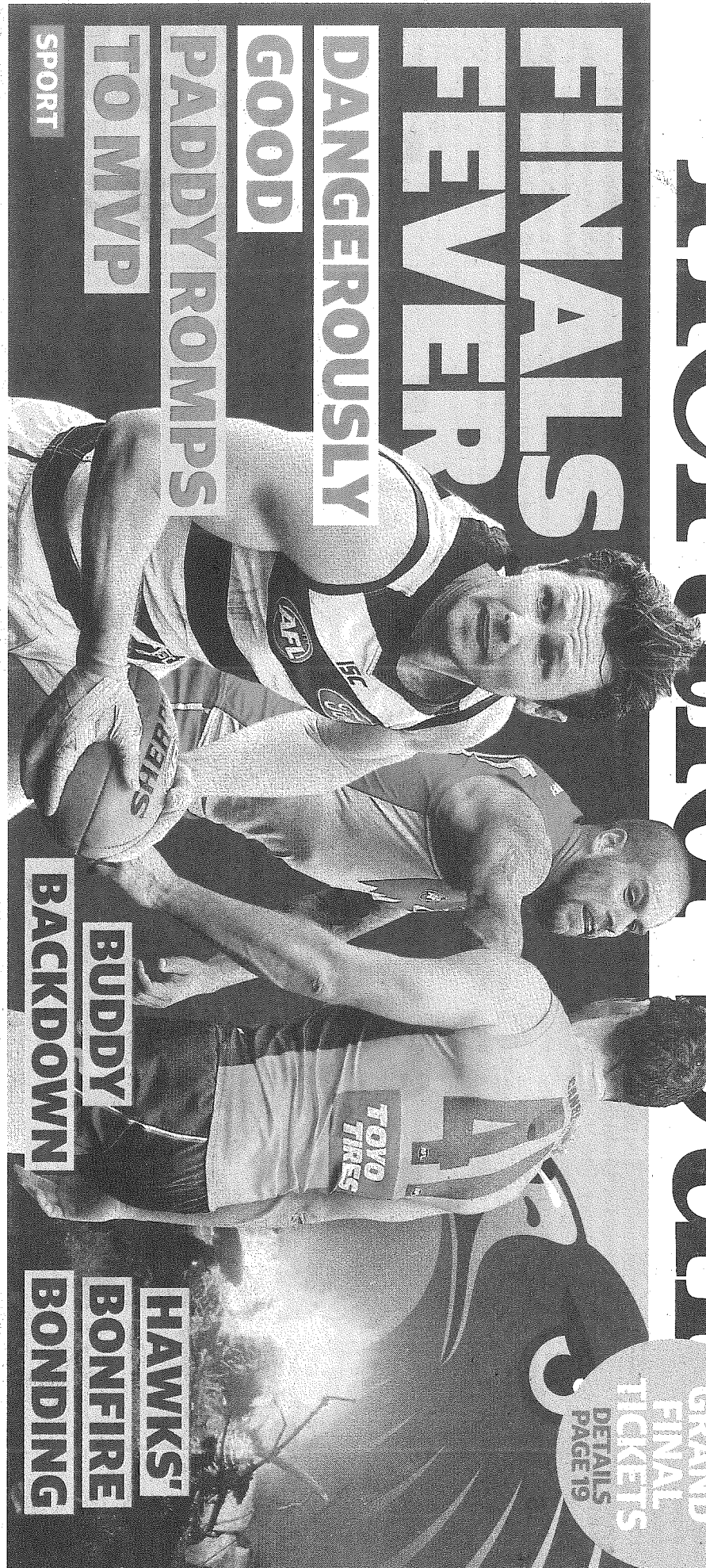


Herald Sun



EXCLUSIVE Melbourne surgeons inject stem cells into man's head in world-first Parkinson's trial

BRAIN REBOOT

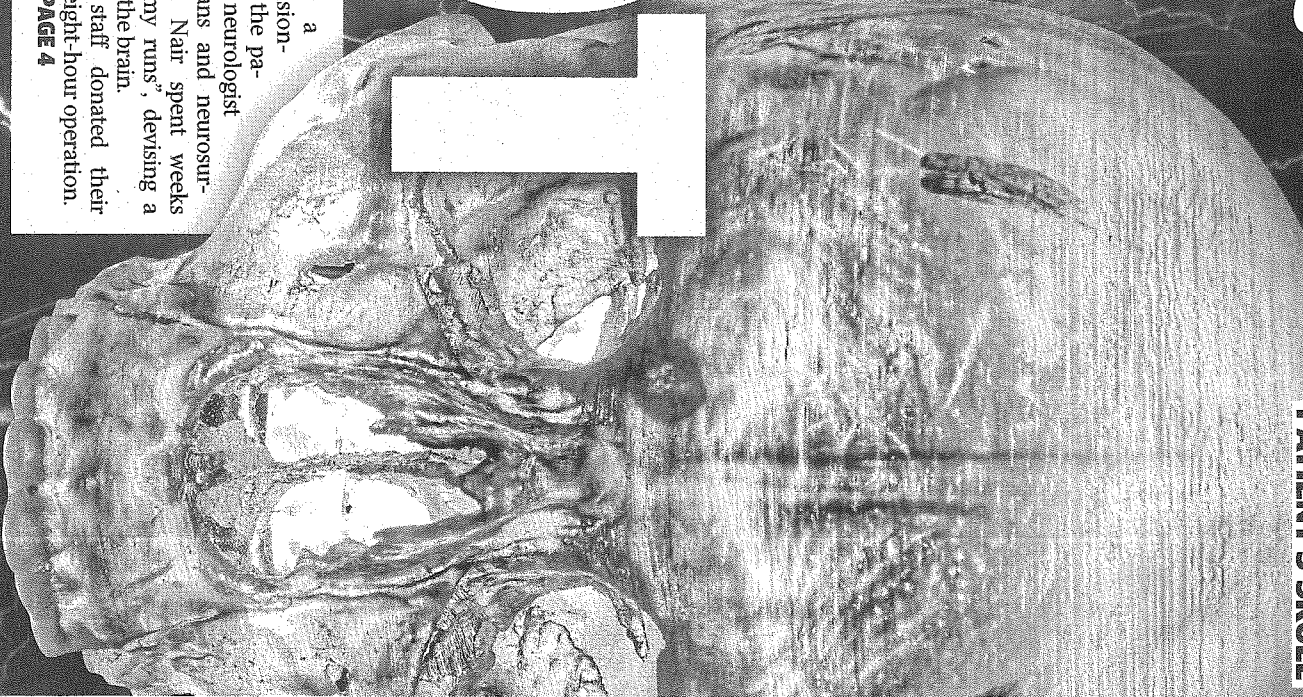
STEM cells have been injected into the brain of a Victorian patient as part of a world-first trial to treat Parkinson's disease. In experimental surgery, Royal Melbourne Hospital neuroscientists transplanted millions of cells at 14 injection sites via just two 1.5cm holes in the skull. The cells, which can metamorphose into brain cells, had been

LUCIE VAN DEN BERG frozen and flown in from the United States, in a global collaboration. It is hoped the cells will boost levels of the neurotransmitter dopamine, a lack of which causes tremors, rigidity and slowness. The therapy, which pushes the frontiers of science and surgery, had shown great promise in pre-

clinical trials, paving the way for human trials. The identity of the patient, 64, remains private while he recovers from the pioneering surgery. Months of planning, which involved designing the operation from scratch, winning regulatory approval, and importing a machine that has never been used in Australia, was required.

Using a three-dimensional model of the patient's brain, neurosurgeon Andrew Evans and neurosurgeon Girish Nair spent weeks doing "dummy runs", devising a way to enter the brain. Hospital staff donated their time for the eight-hour operation. **CONTINUED PAGE 4**

3D RECREATION OF PATIENT'S SKULL



P6-7 BABY BONUS BONUS SCRAPPED



P3 BELLE AIRIED



BEST IN TV GUIDE 800 WORDS

Cancer top of kill list

Report shows heart diseases surpassed

CANCERS have overtaken heart diseases as Australia's biggest overall killer for the first time.

New data shows while coronary heart disease continues to be the nation's single leading cause of death, cancer, as a group of diseases, were responsible for more deaths in 2013 than any other disease type.

Released every two years, the latest Australian Institute of Health and Welfare Australia's Health report predicts 46,900 people nationwide would die from cancer this year — 128 people every day.

The report found cancer caused 44,100 deaths in 2013, surpassing deaths from cardiovascular diseases (43,600).

Cancer Council Australia chief executive Sanchia Aranda said despite survival rates continuing to improve cancer was, regrettably, a "growth industry" because of the nation's ageing population.

But she said about one third of cancers could be prevented through lifestyle changes and early detection.

Between 1982-86 and 2007-11 the five-year survival rate for cancer rose from 40 per cent to 66 per cent for men and from 52 per cent to 68 per cent for women, according to the AIHW report.

Coronary heart disease remains the nation's single leading cause of death for both men and women, followed by dementia and Alzheimer's dis-

ease, cerebrovascular disease, and lung cancer.

According to the report, suicide was the most common cause of death for men and women aged 15 to 44 years, and children were most likely to die in car crashes.

Heart Foundation chief executive John Kelly said some cardiovascular diseases were potentially preventable, but the report showed "complicity among the whole community".

"With an ageing population and the list of risk factors getting worse, more leadership must be undertaken by government to encourage individuals to more actively engage in prevention strategies," he said. The report found one in four Australians suffered from multiple diseases, with chronic conditions representing the biggest burden to the nation's health system.

Health Minister Sussan Ley said the government's \$21.3 million trial of up to 200 homes announced in the 2016-17 Budget puts the onus on GPs to provide individually tailored care plans for patients. The report said improvements had been made in closing the gap between the health of indigenous and non-indigenous Australians, but indigenous life expectancy remained 10 years shorter.

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DOCTORS REBOOT BRAIN IN PARKINSON'S TREATMENT TRIAL



BRAIN/STEM CELL TRANSPLANTS

- Two holes 15mm in size are drilled in the top of the skull.
- A cannula (small plastic tube) 1.65mm diameter is carefully guided down through the brain tissue forming two tiny tracks.
- Seven sites on each side of the brain are injected with the stem cells.
- Each injection site receives 21.4 micro litre of stem cells (a micro litre is one-millionth of a litre) at a rate of five micro litres per minute.
- The patient gets 300 micro litres in total before the cannula is threaded back out along the two tracks and out of the two holes.
- This type of stem cell, a pluripotent stem cell, is a master cell that can change into any cell in the body but it is highly influenced by its environment.
- At six and 12 months, they will scan the patient to see if the cells have changed into brain cells that boost dopamine levels.

FROM PAGE 1

Using the imported machine, the doctors travelled deep into the brain, making tiny tracks in the delicate tissue with cannulas to reach seven target sites on each side of the brain, leaving only a small surgical footprint.

A minuscule quantity of cells was implanted at a precise rate, totalling 300 microlitres.

Risks include paralysis, stroke, or death. If the cells escaped into the spinal fluid they could be lost, if they were injected too slowly they could become stuck, or they could grow rapidly into a tumour.

The surgery used pluripotent stem cells, which can change into any cell in the body. But being highly suscep-

tible to their environment, "peer pressure" influences their transformation.

Dr Evans, the trial leader, said: "The idea with cellular replacement therapy is to be able to implant cells that will differentiate or change from stem cells into cells that either produce dopamine or provide other forms of support to remaining neurons."

The unique treatment uses neural stem cells, derived from unfertilised eggs manufactured in a laboratory by the International Stem Cell Corporation in the US.

"Eventually we hope that we can use our therapy to cure Parkinson's disease," the ISCC's chief scientific officer Russel Kern said.

The team did a scan 24 hours after the operation and were relieved to discover all target sites had been reached without complications.

The patient recovered quickly and was discharged within 72 hours.

No drugs have succeeded in stopping the progression of Parkinson's, which affects 10 million people worldwide, and treatments for symptoms eventually become ineffective.

It is not yet known if the treatment has been successful, and a cautious Dr Evans said the trial first had to determine its safety. Eleven more patients will now have the surgery. Final results will be known in two years.

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